

REMARKS/ARGUMENTS

Responsive to the Official Action mailed May 18, 2006, applicants have further amended the claims of their application in an earnest effort to place this case in condition for allowance. Specifically, independent claims 5 and 6 have been amended. Reconsideration is respectfully requested.

Arguments to Overcome Prior Art Rejection(s)

I. Response to 112 2nd Rejection

The rejection of claims 5-6 for indefiniteness under 35 USC 112, second paragraph, should be overcome by the above-requested amendment that deletes the previously added "100%" qualification for the recited nonwoven fabric.

The most recent Office Action explains that the "100% nonwoven" language was "interpreted as referring to the methods of joining layers."

The proposed amendments to claims 5 and 6 eliminate the "100%" recitation and substitute language therefor in the claims based on the specification teachings that would more clearly reflect the Patent Office's interpretation of the subject recitation, viz., the nonwoven first and second layers are in a directly adjacent, hydroentangled united arrangement. No new issues should be raised by these requested amendments that would require additional search or consideration.

II. Response to 103 rejection of Claims 5, 7 and 8

Reconsideration and withdrawal of the rejection of claims 5, 7 and 8 as being obvious under 35 USC 103(a) over Price (US 2004/0132368) in view of Kierulff (U.S. 6,660,503) is respectfully requested.

In accordance with the present invention, a flame-retardant nonwoven fabric comprises a nonwoven first layer and a nonwoven second layer in a directly adjacent, hydroentangled united arrangement. Moreover, the first layer consists essentially of a blend of lyocell fiber and modacrylic fiber. The fibrous blend of the first layer provides the fabric with enhanced strength, a soft hand, and form a char instead of melting (page 4, lines 3-6). Directly adjacent the first layer is a second layer which comprises a blend of lyocell fiber, modacrylic fiber, and para-amid fiber. Incorporating one or more para-amid fibers maintains the fibrous structural integrity of the fabric, as well as reduces any thermal shrinkage (page 4, lines 5-7). The composite of fibers utilized within the flame retardant layered fabric has a synergistic relationship to provide a cost effective fabric with exceptional strength, softness, and flame retardancy, wherein upon burning, the fabric chars, yet retains its structural integrity due to the incorporation of para-amid fiber in the second layer (page 4, lines 9-13).

Importantly, the lack of para-amid fiber in the first layer of the flame-retardant nonwoven fabric of the present invention masks the discoloration of the second layer that may occur from the presence of the para-amid fiber therein (page 4, lines 14-18).

In contrast, Price doesn't appear to appreciate the significance of only including para-amid in one of the nonwoven layers but not the adjoining layer, and Price does not appear to recognize that such an arrangement is useful for masking discoloration of the adjacent layer containing para-amid fiber.

The Examiner also is understood to continue to premise this rejection on an assumption that:

"...lyocell is known in the art to be functionally equivalent to the natural fibers taught by Price, a position supported by Kierulff, which teaches flame retardant fabrics using cotton, linene, lyocell, and other interchangeably [no Kierulff citation provided]... "

(Office Action of 5/18/06, pg. 3).

This statement by the Patent Office is understood to be an admission that Price fails to teach or suggest the recited lyocell fiber constituent required of each of first and second layers of the present claimed invention.

Applicants disagree that "natural fibers" are recognized functional equivalents in the art to lyocell fibers. As is now well known, the fiber generically known as "lyocell" is a fiber manufactured by the dissolution of cellulose in N-methylmorpholine N-oxide (NMMO), extrusion to form filaments, washing, and drying. For example, see U.S. Patent Nos. 5,725,821 and 6,042,769.

Moreover, Kierulff teaches a drastic modification of polysaccharides by means of a phenol oxidizing enzyme before they are used in textiles (abstract). Kierulff indicates that cotton, viscose, lyocell, flax, ramie or blends thereof can be subjected to the enzymatic oxidation treatment as a preparation for textile manufacture, and that the resulting functionalized fibers can be used for a variety of specialty fabrics such flame retardant fabric, amongst many others mentioned (col. 3, lines 33-46; col. 5, lines 56-64; col. 6, line 63 to col. 7, line 4).

Among other differences from Kierulff, the present invention avoids the need for such additional enzymatic oxidation processing treatments to be performed on the lyocell fibers used in the first and second layers.

Moreover, the indicated use of blends of lyocell and cotton by Kierulff indicates appreciated differences between the two types of fibers. Kierulff does not state that natural fibers such as cotton are functional equivalents for lyocell, much less in the specific context of nonwoven fabric constructs. Instead, Kierulff indicates that each fiber type is suitable for his enzymatic oxidation treatment, before usage in textile manufacturing.

In view of the above, reconsideration and withdrawal of this rejection is believed to be in order and is respectfully requested..

III. Response to 103 rejection of Claims 6, 9 and 10

Reconsideration of the rejection of claims 6, 9 and 10 as being obvious over Price in view of Kierulff as applied to claim 5, and further in view of Putnam (US 2002/002764) is also respectfully requested.

Putnam nowhere describes application of his technology to para-amid fiber containing webs, nor to flame retardant nonwoven fabric constructs (see, e.g., [0030], [0032]). In particular, Putnam does not describe selective use of para-mid fiber in a laminated fabric with fire-retardant properties, wherein it is used in combination with lyocell fiber and modacrylic fiber in one nonwoven layer but not an adjoining nonwoven layer.

Therefore, Putnam does not compensate for the above-identified shortcomings of the primary reference to Price, nor those of the secondary reference of Kierulff.

In view of the foregoing, formal allowance of claims 5-10 is believed to be in order and is respectfully solicited. Should the Examiner wish to speak with applicants' attorneys, they may be reached at the number indicated below.

Application No. 10/810,386
Amendment dated August 17, 2006
Reply to Office Action of May 18, 2006

The Commissioner is hereby authorized to charge any additional fees which may be required in connection with this submission to Deposit Account No. 23-0785.

Respectfully submitted,

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I hereby certify that this AMENDMENT is being deposited with the United States Postal Service "Express Mail Post Office To Addressee" service under 37 CFR 1.10 addressed to Commissioner of Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, Express Mail Label No. EV 843641122 US on **August 17, 2006.**


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